Forward Looking Infrared

And the Bradley Fire Support Vehicle

Infantrymen have long relied upon the indirect fire of the field artillery to complement their scheme of maneuver. In two World Wars, on the frozen hills of Korea, in the Ia Drang valley of Vietnam, and in battles on the Iraqis' home turf during the Persian Gulf war, U.S. artillerymen have been a vital element of the combined arms team.

The cover of night that once concealed our enemy has been stripped away by our technological lead, revealing his troop dispositions, his capabilities, and—most important—his vulnerabilities. Many tales have been told of Iraqi tankers demoralized by the sudden explosion of the vehicle next to them, hit at night and by an invisible Coalition tank firing from a position beyond the range of their own guns. Equally numerous are the accounts of enemy units suddenly subjected to precision artillery fire directed by observers they could not even see.

It is clear that U.S. forces do indeed dominate the night, but we can ill afford to rest on laurels earned at high cost in lives, money, and equipment in other wars and less successful battles.

Artillery forward observation will be as crucial as ever. The observer will still need to be far enough forward to influence the battle by providing responsive, accurate indirect fires. On today's fluid battlefield, that may mean the observer is well forward. If we expect him to do his job, we need to provide him the equipment to assure his survivability, his ability to acquire targets, and the means to communicate his information to the firing batteries. The answer to these requirements is the Bradley fire support vehicle (BFSV).

The BFSV will be the end result of a retrofit of the M2A2 Bradley fighting vehicle with fire support team vehicle (FIST-V) conversion kits. It will retain the present Bradley signature to the maximum extent possible, and will significantly improve both the survivability and the mobility of the artillery support personnel with heavy maneuver units. It will replace the M981 tracked vehicles currently with company fire support teams (FIST) and the combat observation lasing teams (COLTs). Target acquisition will be greatly improved through the addition of second-generation thermal imaging such as the forward looking infrared (FLIR).

The BFSV's major subsystems will include an improved north-seeking gyroscope as part of the FIST-V kit, single-channel ground and airborne radio system (SINCGARS) AN/VRC-12 radios, and a precision global positioning system (GPS) receiver. The vehicle's targeting system will include day-night thermal imagery, and its communications will enable the team to operate on four nets with its AN/VRC-12 family of radios. Digital message devices, AN/PSG-5 and AN/PSG-2, will further improve the team's ability to transmit data. Fielding of the vehicle is planned for the first quarter of Fiscal Year 1998.

This, therefore, is the Bradley fire support vehicle; but what were the events that led to its development as a replacement for the M981?

Both the BFSV and the FLIR capability that will complement it received their impetus largely as a result of the Gulf war. That conflict demonstrated the extent to which our forces could seize and retain the initiative in night operations, as well as under other conditions of reduced visibility, and underscored the terrible cost of confronting a technologically superior opponent.

In August 1992 General Frederick M. Franks, Jr., Commander, Training and Doctrine Command, assigned the Dismounted Battlespace Battle Lab at Fort Benning the mission of ensuring that we continue to own the night on future battlefields. Key to this mission was the establishment of the Department of the Army Second-Generation FLIR Special Task Force in February 1993, under the auspices of the Battle Lab. Major General Jerry A. White, Commandant of the Infantry Center and School, and Mr. George Singley, Deputy Assistant Secretary of the Army for Research and Technology, serve as chairpersons of the task force.

The task force will work to improve current and future infrared technologies, and will do it in an environment of greatly reduced resources. Simply put, we must find a way to get more—and better—systems with fewer defense dollars.

One way of achieving this is through

horizontal technology integration (HTI), which draws upon the commonality of requirements and processes throughout the Army, thus rendering obsolete the costly and inefficient "stovepipe" development and procurement method of examining each weapon system singly. Applied to second-generation FLIR, the HTI initiative will dramatically improve combat power on the battlefield. Applied to the BFSV, it will double the combat identification range capability of the first-generation FLIR now in use; and it will reduce the likelihood of fratricide by improving our ability to distinguish friend from foe, even at extended ranges.

Extended combat identification range and reduced probability of fratricide are not the only advantages of the BFSV. Other advantages will permit commanders to detect, identify, and engage targets at greater ranges; they will therefore have more time to make decisions and better synchronize fire and maneuver. Phototelesis technology will provide the ability to transmit FLIR imagery, improving command and control, along with the commander's ability to accurately assess the situation to his front.

The FLIR package also includes other improvements such as a digital electronic input-output port for automatic target cueing, target tracking, target recognition, battlefield digitization, combat identification, and other built-in test functions. The BFSV gunner-operator will then be able to electronically zoom the target view to reduce the acquisition and engagement time, select white-hot or black-hot imagery—much as in the images now available in tank thermal sights—and insert annotations and reticles to facilitate target engagement.

The Bradley fire support vehicle's configuration as a Bradley will render it virtually indistinguishable from the Bradleys of the maneuver force it is supporting, will afford observers the mobility to keep pace with the Bradley-Abrams combined arms team, and will ensure that the combined arms team retains its ability to move fast, strike hard, and dominate the modern battlefield. *(This article was prepared by the staff of the Dismounted Battlespace Battle Lab at Fort Benning.)*

The Q-36 Weapons Locating Radar

A Primer for Brigade Commanders and Staffs

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During the early phases of contingency operations, units can expect to live off the tailgates of C-130 aircraft operating on a forward landing strip. Knowing the effect the enemy's indirect fire can have on this lifeline, these units need a system that will prevent enemy mortars and artillery from interdicting their lines of communication.

Imagine a system that could acquire enemy mortars and artillery firing to an accuracy of 100 meters. This system would report this information to the brigade tactical operations center (TOC) before those rounds hit. If the commander desired, it could transmit fire commands to the brigade's direct support howitzers before the rounds hit. It would shut down the enemy's indirect fires, allowing safer conditions in which to conduct logistical and tactical operations.

Fortunately, this system is already in infantry brigades, and the opposing force (OPFOR) at the Joint Readiness Training Center (JRTC) has already determined it to be a high payoff target.

The AN/TPQ-36 weapons locating radar—fielded during the early 1980s—is organic to the direct support artillery battalions of the Army's light, air assault, and airborne divisions. During early JRTC rotations, however, some combined arms commanders left this radar system at their home stations. As they became more aware of its capabilities, most of them began deploying it into the landing strip within the first ten chalks. To make the most of the Q-36 weapons locating radar, brigade commanders and staff officers need to understand its capabilities and limitations.

Q-36 Radar Capabilities

The Q-36 can acquire mortar, artillery, and rocket fires out to a range of 24 kilometers. The core of the system consists of three components—an antenna, an operations control group (in a common shelter), and a generator.

In the original configuration, the Q-36 is mounted on two five-ton trucks with trailers. The radar section also has